a small sum from the J. Lawrence Smith fund for the purpose of extending the work.

For observations of meteors a technical knowledge of astronomy is not necessary. Anyone interested as an amateur is invited to write to the Leander McCormick Observatory. Maps and directions for observing will gladly be forwarded. It is earnestly hoped that a large number of amateurs will assist us in the extension of this work.

THE BASAL SILURIAN FORMATIONS OF EASTERN NORTH AMERICA

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At the base of the Silurian system of rocks in the state of New York and in the Appalachian Mountains occurs the Medina sandstone. In tracing this formation from the gorge of the Niagara River northwestward into Ontario, the sandy phase of the Medina is seen to change gradually into a muddy one and finally into a limestone, as is the case on the Manitoulin Islands of Lake Huron. These early Silurian rocks of Ontario, known as the Cataract formation, have long been regarded as equivalent to the Clinton formation of New York, but are now known to hold the time of the Medina formation. In another direction, in Ohio, Indiana, and Kentucky, the basal Silurian strata, the Brassfield formation, are also seen to be the equivalent of the Cataract formation of the north.

The faunas of these three marine formations are quite different. The Medina sandstone has the smallest assemblage, with 22 species, while the Cataract limestones have at least 76 forms, and the Brassfield limestones 140 kinds of invertebrates. There are but 7 species in common between the Medina and Cataract, while the latter has 24 forms repeated in the Brassfield.

Each one of the three formations represents a different marine basin. The Medina is of the Appalachian province, is a sandstone formation, and finally invades to a slight extent the area of the Cataract. The Brassfield province lies in the main west of the Cincinnati axis, is of southern origin, with limestone-making seas, spreads also up the southern portion of the Appalachian province, and finally likewise invades slightly the area of the Cataract sea. On the other hand, the Cataract province spreads westward through the Saint Lawrence embayment, and finally, in eastern Ontario and northwestern Ohio, unites with the

other two provinces. The normal marine junction of the Cataract and Brassfield seas is prevented by the Medina delta of sands. For these reasons, Medina, Cataract, and Brassfield are to be retained as names for independent marine faunas and formations. The details leading to these conclusions are set forth in a contribution entitled 'Medina and Cataract formations of the Siluric of New York and Ontario,' *Bulletin of the Geological Society of America.*

A METHOD OF OBTAINING COMPLETE GERMINATION OF SEEDS IN *OENOTHERA* AND OF RECORDING THE RESIDUE OF STERILE SEED-LIKE STRUCTURES

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All genetical workers with *Oenothera* shortly become aware that generally only a small proportion of the seed-like structures sown in their seed pans produce seedlings before the pans are emptied to give place in the hot house for the developing culture. My own practice has been to keep seed pans from eight to ten weeks only, as it is uncertain, if sowings are made in January, whether seedlings appearing later can be brought to maturity during the summer. For the past three seasons I have counted the seeds sown and thus have obtained some information on the relative degrees of fertility in my cultures which in some cases have been surprisingly low. But this procedure does not give accurate data on the proportion of fertile seeds to sterile seed-like structures for the reason that germination of *Oenothera* seeds in earth is very irregular and may be delayed far beyond the time that it is convenient or possible to keep the seed pans. Seeds sown in earth are obviously lost for further enquiry as to the fact of their viability, a proportion of seedlings appears but, as for the residue, that cannot be examined.

The technical problem of obtaining from sowings of seeds cultures that will accurately represent the genetical possibilities of the sowing is under these conditions difficult. In *Oenothera* work this problem is vital for exact studies since through the delayed germination may be lost not only peculiar individuals but possibly, in the case of hybrids, entire classes of segregates. It is probably safe to say that no culture of *Oenothera* has as yet been described in which we may feel confident that all of the viable seeds have germinated. Consequently we cannot be certain that any of the reported percentages of 'mutants' or ratios of segregates from hybrids are correct. Furthermore it is important